

ENVIRONMENTALLY CORRECT CONCEPTS, INC.

FARM BILL FORUM

FARM PROGRESS SHOW - SEPTEMBER 1, 2005 - DECATUR, ILLINOIS

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Good afternoon –

I am John Caveny, a grass farmer from Monticello, Illinois. I grow grass for animal feed and base-load renewable energy. I am also president of Environmentally Correct Concepts, Inc. (ECCI) – a company that develops biomass energy projects and has patented practical climate change mitigation technology. I believe that farm and ranchland should be “working land” instead of “retired land” and managed to make money from core agricultural enterprises and ecosystem services. My comments address questions 2, 3, 4, 5 and 6.

Environmentally Correct Concepts, Inc. believes the United States can be a leader in reducing rates and amounts of greenhouse gases going into the atmosphere by using plant based renewable fuels, market forces, and voluntary programs, as well as through creation and expansion of carbon sinks on public and private land.

Green power from biomass crops provides an opportunity for agricultural and energy sectors to work together to find profitable and sustainable new crops for producing base-load electricity, liquid transportation fuel and synthetic natural gas. The new farm bill needs to encourage the use and production of biomass energy crops through Federal Crop Insurance risk management products.

The high yielding grass *Miscanthus x giganteus* is particularly suited as a green power fuelstock. Published research conducted by Heaton et al, ¹ at the University of Illinois in Urbana, calculates that growing and harvesting *Miscanthus* on just 10% of the farmland in Illinois would produce enough carbohydrate energy to produce 50% of the states' electricity. This calculation begins to quantify the potential impact that biomass crops can have on farm income and energy security.

Our domestic industries, our society and our financial systems are built on the assumption of constant growth based on readily available cheap fossil fuels. Growing and processing *Miscanthus* from the Great Plains eastward, would allow this trend to continue and provide these regions with new industry. Farmers will grow this sterile plant using techniques that build levels of organic matter in the soil thereby expanding carbon sinks. Farmers and ranchers will contract with Fortune 500 companies and others as greenhouse gas scavengers. They will be paid for removing nonpoint emissions of carbon dioxide and methane through improved agricultural activities.

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On August 29, 2005 Secretary Johanns announced the formation of A Market-Based Environmental Stewardship Coordination Council. ECCI applauds this innovation as a step towards enabling farmers and ranchers to realize a new recurring source of income from environmental stewardship. ECCI owns and has licensed certain key intellectual property needed to accelerate this financial opportunity.

Producing cellulosic biomass for base-load renewable energy and other uses will provide farmers and ranchers with a new crop and many rural communities with new processing businesses and allied agricultural services opportunities. All of us will benefit from blue sky, green grass and fresh air.

Thank you for listening.

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¹ Heaton, E.A., J. Clifton-Brown, T.B. Voigt, M.B. Jones, S.P. Long, 2004. Miscanthus for Renewable Energy Generation: European Union Experience and Projections for Illinois. Mitigation and Adaptation Strategies for Global Change 9: 433-451

ENVIRONMENTALLY CORRECT CONCEPTS, INC.

Growing Miscanthus in Illinois -- 3 Years of On-Farm Research in Piatt County

Introduction – What is Miscanthus?

Miscanthus x giganteus is a tall perennial grass from Southeast Asia. For decades this grass has been used as an alternative energy source in Europe because it produces large amounts of biomass that can be used as fuel. While other *Miscanthus* species may be familiar to many as flowering garden ornamentals, it is the sterile interspecific hybrid *M. x giganteus* that is of interest to agriculture.

Miscanthus x giganteus is the result of a cross between *M. sinensis* and *M. sacchariflorus* and is not capable of reproducing, just as a mule is the sterile result of a cross between a horse and a donkey. Seeds, if produced, are sterile. *Miscanthus x giganteus* spreads naturally by means of rhizomes (underground storage organs), however, they spread very slowly so there is no escape to adjacent landscapes. Rhizomes can be split and the pieces re-planted to produce new plants. All propagation, maintenance and harvest operations can be done with conventional farm machinery

Miscanthus x giganteus is planted in the spring after danger of frost. Following the initial establishment year, yields double each year until a ceiling yield is achieved, typically in the 3rd year. These yields are maintained for the lifetime of the crop, about 30 years in Illinois. A typical annual production cycle is as follows:

April: Shoots emerge

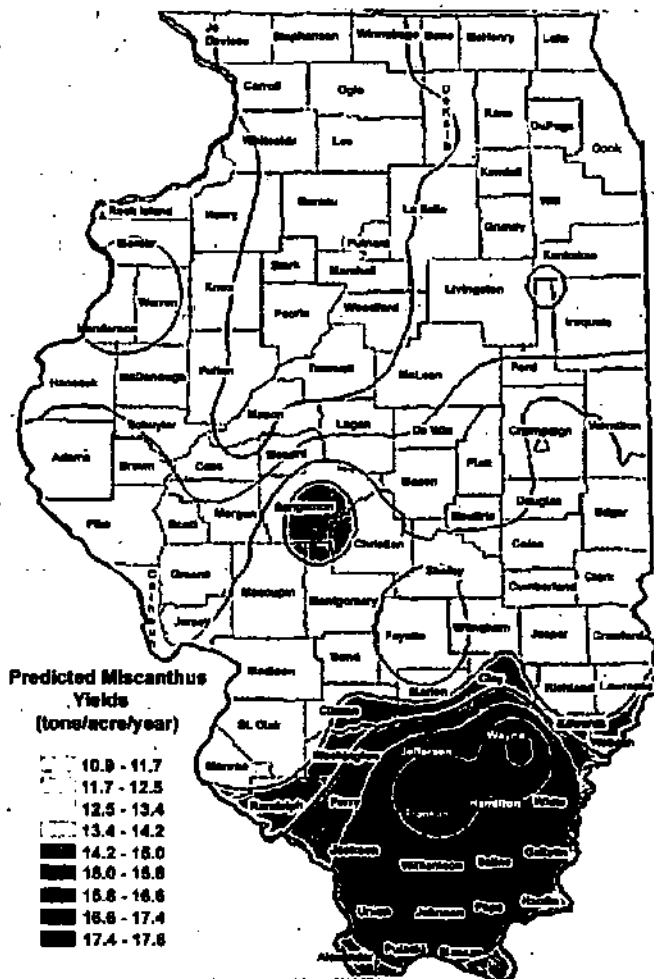
August - September: Maximum biomass is achieved.

October - November: Crop dries down in field (moisture less than 20%). Nitrogen from the dying shoots is sent back to the rhizomes for next year's growth.

December – March: Dried crop is harvested.



Miscanthus Ready for Harvest



Boerra, E.A., J. Clinton-Brown, T.E. Voigt, M.R. Jones, and K.F. Long. 2004. Mitigation and Adaptation to climate (in *Global Change* 9:227-251). Map courtesy of Paul Staveck.

Growing It

Three years of on-farm research is not enough time to confirm solid Best Management Practices (BMP's) – but this is what we have learned so far:

Soils - Two test beds are in production. One is on Highly Erodible Land (HEL). Soils are 145C2 Saybrook; PI 132 and 56B Dana; PI 139. A second test bed is on non-HEL 74 Radford; PI of 140. The pH of both test beds is within the optimum pH range for *Miscanthus x giganteus* of 5.5 – 7.5.

Temperature - *Miscanthus x giganteus* growth begins and ends within a temperature range similar to alfalfa. Early spring growth is susceptible to frost like alfalfa. A hard, late spring frost may decrease yield for that year.

Water - *Miscanthus x giganteus* likes water and can tolerate periodic flooding. In the first year timely water is important for establishment. Once established, *Miscanthus x giganteus* makes very good use of early season moisture, and may even stop growing during summer dry spells and resume growth when moisture returns.

Planting - Current practice is to plant *Miscanthus x giganteus* rhizomes in a well prepared seedbed using vegetable planting equipment. At this time we recommend covering the rhizome with about 2" of soil. Rhizomes should not be planted below this depth.

Fertilizer - Our experience has shown that in the establishment year on HEL soils, *Miscanthus x giganteus* needs the same amount of fertilizer as corn. An annual application of about 40 pounds of actual NPK/acre is needed in subsequent years. On non-HEL soils, an annual application of fertilizer may or may not be needed.

Weed Control - In the establishment year, weeds will compete with *Miscanthus x giganteus* for light, water and nutrients. Controlling broadleaf weeds as well as annual grasses is essential. Control may be achieved by mechanical cultivation as well as applications of pre-plant and post emergent herbicides. Atrazine and Pendimethalin (Prowl®) may be applied pre-plant for control of certain annual grasses and broadleaf weeds. Post applications of 2, 4-D may be used for control of broadleaf weeds.

After the establishment year, minimal weed control is necessary. This might include the use of glyphosate applied to perennial weeds and grasses that emerge and grow before *Miscanthus x giganteus* breaks dormancy. After the second year, weed control is probably not necessary because *Miscanthus x giganteus* out competes weeds due to early vigorous growth.

Pests and Diseases - There are no reported insect pests or diseases in Illinois that significantly affect the production of *Miscanthus x giganteus*.

Harvesting - Harvest can occur anytime during the window between crop dry-down in the autumn and crop emergence in the spring. Harvesting in December or January is recommended to exploit the low moisture conditions typical of this time of year as well as to avoid yield losses that may occur with repeated exposure to snow and ice. *Miscanthus x giganteus* can be harvested using a mower conditioner followed by baling, or it can be direct cut using a forage harvester.

Contacts for more information

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